

WINTER 2019



# DESIGN-BUILD SOLUTIONS

ESI is a nationally recognized design-build firm specializing in food facility design and construction.



## Commissioning DESIGN-BUILD PROJECTS

To complete a successful design-build project, companies must enforce communication, plan out a clearly-defined scope of work and hire an experienced contractor. That's why commissioning has become a key ingredient in the mix, ensuring that buildings are delivered according to the owner's project requirements.

Commissioning is defined as "the process of ensuring that systems are designed, installed, functionally tested and capable of being operated and maintained to perform in conformity with the design intent," according to The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Atlanta, and The National Institute of Building Sciences (NIBS), Washington, D.C., guidelines.

But, for design-build firms such as ESI Group, Hartland, Wis., commis-

### QUICK FACTS

Square Feet  
Commissioned:

**3.92mil**

Deficiencies  
Detected:

**2,000**

Deficiencies  
Fixed:

**100%**

sioning (Cx) requirements go beyond the start-up and documentation.

"ESI strives to validate that the building design meets the owner's expectations, that the building is constructed to meet the design documents and that the systems operate to maximize comfort and energy efficiency," says Michael Kopp, senior mechanical engineer for ESI Design Services, Inc., Hartland, Wis.

And, Cx doesn't just apply to LEED-certified buildings, or those looking for a more sustainable approach.

Commissioning benefits owners through improved energy efficiency, enriched workplace performance due to higher quality environments and prevention of business losses, as outlined in NIBS' Whole Building Design Guide.

"Commissioning is a value-added resource in which our clients can expect to benefit in areas such as first cost, safety, comfort, reliability, energy use, staff acceptance and knowledge of the building systems," Kopp adds. "Commissioning integrates into your

## FEATURED PROJECT

# How 3D Laser Scanning Improves Accuracy of Design-Build Projects

**W**hen it comes to building a new or renovating an existing facility, one thing is for certain—gathering information can be taxing.

That's why ESI Group, Hartland, Wis., invested in a 3-dimensional (3D) laser scanner.

The 3D scanning market is expected to grow above \$8 billion by 2025, according to Grand View Research, Inc., San Francisco. Furthermore, the Rhodes Group, Pittsburgh, Pa., reports 3D laser scanning can reduce total project costs by as much as 5-7%, and can condense the schedule by as much as 10%.

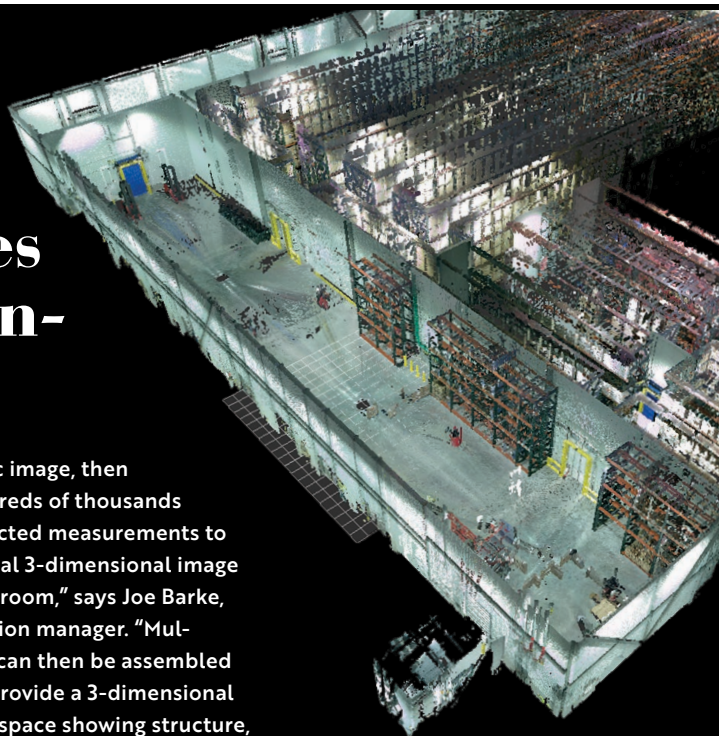
"The scanner will take a 360-degree

photographic image, then overlay hundreds of thousands of laser-reflected measurements to create a virtual 3-dimensional image of a space or room," says Joe Barke, preconstruction manager. "Multiple images can then be assembled together to provide a 3-dimensional image of the space showing structure, equipment and utilities."

3D laser scanners provide insight into every aspect and phase of construction, from initial concept to the completed project.

"Utilizing a semi-autonomous machine to collect, analyze and assemble data into a functional

virtual workspace will maximize the probable and minimize the hypothetical," adds Barke. "Accuracy begets efficiency. This is just another small tool in the box to combine the latest design technology available to a modern design builder."



## COMMISSIONING continued ...

### ESI's 15-STEP Cx PROCESS:

- 1 Identify project requirements.
- 2 Establish basis of design.
- 3 Formulate commissioning plan.
- 4 Provide design review.
- 5 Document Cx specifications.
- 6 Review submittals.
- 7 Conduct Cx meetings.
- 8 Create construction checklists.
- 9 Document functional tests.
- 10 Maintain list of issues.
- 11 Compile manual systems.
- 12 Undergo training.
- 13 Write Cx report.
- 14 Conduct seasonal testing.
- 15 Perform 10-month review.

design and construction process and aligns with designers, engineers, installers, equipment providers and the owner's building stake holders, whom

will become part of the Cx team."

On the other hand, Cx does reveal some common deficiencies like differential pressure, air filtration, balance issues and graphics. Sometimes specified control strategies are not followed, and third-party equipment, alarms and safeties fail to communicate with building automation systems. There are also times when occupancy sensors are not calibrated, which affects lighting control, HVAC setbacks and operating times.

At the end of the day though, Cx assists in the delivery of a project that provides an efficient, safe and healthy facility, according to NIBS' Whole Building Design Guide. Cx optimizes energy use, reduces operating costs, ensures adequate O&M staff orientation and training and improves installed building systems documentation.

"If you're taking your facility to the next level through a design-build project, take it a step further through commissioning and verify your facility is operating as the design intended," says Kopp. ●

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